

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/14537

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C09K19/04 C09K19/34 C09K19/38

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C09K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 116 769 A (FUJI PHOTO FILM CO LTD) 18 July 2001 (2001-07-18) cited in the application	1-7, 9-12, 14, 17, 18
Y	page 7, paragraph 17	16
A	page 10, paragraph 39 -page 13, line 28 claims; examples	8, 13, 15
Y	WO 92/16519 A (SECR DEFENCE BRIT) 1 October 1992 (1992-10-01) page 4, paragraph 2 -page 5, paragraph 3; claims	16
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

4 May 2004

Date of mailing of the international search report

21/05/2004

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 033 731 A (FUJI PHOTO FILM CO LTD) 6 September 2000 (2000-09-06) cited in the application page 22, paragraph 59 page 26, paragraph 82 -page 40, paragraph 87 claims; examples	1-7, 9-11,14, 17,18
X	YUICHIRO HARAMOTO ET AL: "NEW PYRIDINIUM TYPE IONIC LIQUID CRYSTAL COMPOUNDS WITH A 1,3- DIOXANE RING IN THE PRINCIPAL STRUCTURE" LIQUID CRYSTALS, TAYLOR AND FRANCIS LTD, LONDON, GB, vol. 21, no. 6, 1 December 1996 (1996-12-01), pages 923-925, XP000639781 ISSN: 0267-8292 the whole document	1-3
X	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 06, 30 April 1998 (1998-04-30) -& JP 10 053585 A (NIPPON CHEM IND CO LTD;HARAMOTO YUICHIRO), 24 February 1998 (1998-02-24) abstract	1-3,14
X	US 5 098 975 A (OMELIS JURGEN ET AL) 24 March 1992 (1992-03-24) column 9, line 64 -column 10, line 2; claim 1	1,12-15
X	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 10, 31 October 1996 (1996-10-31) -& JP 08 157456 A (DAINIPPON PRINTING CO LTD), 18 June 1996 (1996-06-18) abstract	1,14
X	WO 87/02693 A (UNIV SHEFFIELD) 7 May 1987 (1987-05-07) claims	1
X	CUI L ET AL: "SYNTHESIS AND THERMAL BEHAVIOUR OF LIQUID CRYSTALLINE PYRIDINIUM BROMIDES CONTAINING A BIPHENYL CORE" LIQUID CRYSTALS, TAYLOR AND FRANCIS LTD, LONDON, GB, vol. 29, no. 9, September 2002 (2002-09), pages 1121-1132, XP001116892 ISSN: 0267-8292 the whole document	1

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X	DATABASE INSPEC 'Online! INSTITUTE OF ELECTRICAL ENGINEERS, STEVENAGE, GB; HARAMOTO Y ET AL: "Liquid crystal properties of new ionic liquid crystal compounds having a 1,3-dioxane ring" Database accession no. 7266074 XP002277948 abstract & LIQUID CRYSTALS, JAN. 2002, TAYLOR & FRANCIS, UK, vol. 29, no. 1, pages 87-90, ISSN: 0267-8292	1
X	DATABASE INSPEC 'Online! INSTITUTE OF ELECTRICAL ENGINEERS, STEVENAGE, GB; KIJIMA M ET AL: "Synthesis of novel ionic liquid crystalline pyrrole derivatives having a viologen moiety" Database accession no. 7123102 XP002277949 abstract & 18TH INTERNATIONAL LIQUID CRYSTAL CONFERENCE, SENDAI, JAPAN, 24-28 JULY 2000, vol. 364, pages 911-918, Molecular Crystals and Liquid Crystals, 2001, Gordon & Breach, Switzerland. ISSN: 1058-725X	1
X	UJIIE S ET AL: "THERMAL AND LIQUID CRYSTALLINE PROPERTIES OF LIQUID CRYSTALLINE POLYMETHACRYLATES WITH AMMONIUM UNITS AND THEIR NON-IONIC FAMILY" POLYMERS FOR ADVANCED TECHNOLOGIES, JOHN WILEY AND SONS, CHICHESTER, GB, vol. 11, no. 8-12, August 2000 (2000-08), pages 450-455, XP000977317 ISSN: 1042-7147 the whole document	1
X	DATABASE INSPEC 'Online! INSTITUTE OF ELECTRICAL ENGINEERS, STEVENAGE, GB; HARAMOTO Y ET AL: "New 1,3-dioxane type ionic liquid crystal compounds having a different counter anion" Database accession no. 6779505 XP002277950 abstract & MOLECULAR CRYSTALS AND LIQUID CRYSTALS, 2000, GORDON & BREACH, SWITZERLAND, vol. 348, pages 129-136, ISSN: 1058-725X	1

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Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>VEBER M ET AL: "IONIC LIQUID CRYSTALS: SYNTHESIS AND MESOMORPHIC PROPERTIES OF DIMERIC 2,4,6-TRIARYLPYRYLIUM TETRAFLUOROBORATES"</p> <p>LIQUID CRYSTALS, TAYLOR AND FRANCIS LTD, LONDON, GB, vol. 27, no. 5, May 2000 (2000-05), pages 671-676, XP000932282 ISSN: 0267-8292 the whole document</p>	1
X	<p>HARAMOTO Y ET AL: "NEW IONIC LIQUID CRYSTAL COMPOUNDS HAVING A 1,3-DITHIANE OR 1,3-DIOXANE RING"</p> <p>LIQUID CRYSTALS, TAYLOR AND FRANCIS LTD, LONDON, GB, vol. 26, no. 10, October 1999 (1999-10), pages 1425-1428, XP000887946 ISSN: 0267-8292 the whole document</p>	1
X	<p>HARAMOTO Y ET AL: "NEW 1,3-DITHIANE TYPE IONIC LIQUID CRYSTAL COMPOUNDS"</p> <p>LIQUID CRYSTALS, TAYLOR AND FRANCIS LTD, LONDON, GB, vol. 24, no. 6, 1 June 1998 (1998-06-01), pages 877-880, XP000773009 ISSN: 0267-8292 the whole document</p>	1
X	<p>ARTZNER F ET AL: "EVIDENCE OF NEMATIC, HEXAGONAL AND RECTANGULAR COMUMNAR PHASES IN THERMOTROPIC IONIC LIQUID CRYSTALS"</p> <p>LIQUID CRYSTALS, TAYLOR AND FRANCIS LTD, LONDON, GB, vol. 23, no. 1, 1 July 1997 (1997-07-01), pages 27-33, XP000701478 ISSN: 0267-8292 the whole document</p>	1
X	<p>HARAMOTO Y ET AL: "A NEW IONIC LIQUID CRYSTAL COMPOUNDS WITH VIOLOGEN GROUP IN THE PRINCIPAL STRUCTURE"</p> <p>LIQUID CRYSTALS, TAYLOR AND FRANCIS LTD, LONDON, GB, vol. 19, no. 3, 1 September 1995 (1995-09-01), pages 319-320, XP000536247 ISSN: 0267-8292 the whole document</p>	1

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P,X	<p>           DATABASE INSPEC 'Online!            INSTITUTE OF ELECTRICAL ENGINEERS,            STEVENAGE, GB;            HARISTOY D ET AL: "Novel ionic            liquid-crystalline compounds bearing            oxadiazole and pyridinium moieties as            prospective materials for optoelectronic            applications"            Database accession no. 7702539            XP002277947            abstract            &amp; CHEMISTRY OF MATERIALS, 20 MAY 2003,            AMERICAN CHEM. SOC, USA,            vol. 15, no. 10, pages 2079-2083,            ISSN: 0897-4756         </p>	1

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Information on patent family members

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